IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the Application:

1. (Currently Amended) A method for depositing a material on a substrate, the method comprising:

placing a substrate on a substrate holder in a chamber having a plasma source, wherein the plasma source comprises an RF source coupled to an upper electrode and ~~on~~ ~~a~~ the substrate holder comprises a bottom electrode coupled to a second RF source;

introducing first processing gases into the chamber using a shower plate assembly coupled to the chamber, wherein the first processing gases include a trimethylsilane (3MS) precursor and Helium (He) gas;

establishing an operating pressure in the chamber, the operating pressure being established at approximately 5 Torr,

depositing a bottom layer portion of a Tunable Etch Resistant ARC (TERA) layer on the substrate, wherein ~~a~~ the first processing ~~gas~~ gases ~~comprising 3MS,~~ ~~CO_2,~~ ~~and He~~ ~~a precursor is~~ are provided to the chamber,[[;]] and the RF source is operated at a power level of approximately 800 watts, the second RF source is operated at a power level of approximately 30 watts, the shower plate assembly having a center region, an edge region, and a sub region configured to establish a first flow rate for the 3MS precursor between approximately 0 sccm and approximately 350 sccm and to establish another first flow rate for the He gas between approximately 0 sccm and approximately 600 sccm when the bottom layer portion is deposited;

introducing second processing gasses into the chamber using the shower plate assembly, the second processing gases including the 3MS precursor, CO_2 gas, and the He gas;

depositing a top layer portion of the TERA layer on the substrate, wherein the second processing gases are provided to the chamber,[[;]] and the RF source is operated at a power level of approximately 400 watts, the center region, the edge region, and the

sub region being further configured to establish a second flow rate for the 3MS precursor between approximately 0 sccm and approximately 75 sccm to establish a flow rate for the CO_2 gas between approximately 0 sccm and approximately 50 sccm and to establish a second flow rate for the He gas between approximately 0 sccm and approximately 600 sccm while depositing the top layer portion;

performing at least one purging process, wherein the RF source is operated at approximately zero watts, an ESC voltage is approximately 0 volts, and the center region, the edge region, and the sub region are further configured to establish a third flow rate for the He gas between approximately 0 sccm and approximately 300 sccm;

performing an evacuation process, wherein the RF source is operated at approximately zero watts, and the operating pressure is established below approximately 2 Torr;

introducing third processing gases into the chamber using the shower head assembly, the third processing gases including CO_2 gas, and He gas;

establishing a post-processing pressure in the chamber, the post-processing pressure being established at approximately 2 Torr,

establishing a post-processing plasma in the chamber, wherein the third processing gases are provided to the chamber the RF source is operated at a power level of approximately 30 watts, and the center region, the edge region, and the sub region are further configured to establish a fourth flow rate for the CO_2 gas between approximately 0 sccm and approximately 40 sccm and to establish another fourth flow rate for the He gas between approximately 0 sccm and approximately 600 sccm during the post-processing plasma;

modifying a top surface of the top layer portion of the deposited TERA layer by exposing the top layer portion of the deposited TERA layer to ~~a~~ the post-processing plasma during the establishing step~~, wherein the post-processing plasma is created using a hydrogen-containing gas, wherein a photoresist-compatible surface is created on the top of TERA layer to prevent the formation of a photoresist foot during a subsequent lithographic operation~~;

performing a pin up process while the post-processing plasma is established, wherein the substrate is lifted off the substrate holder using one or more lift pins; and

further modifying the top surface of the top layer portion of the deposited TERA layer by exposing the top surface of the top layer portion of the deposited TERA layer to the post-processing plasma during the pin up process step, wherein the modified top surface is created on the top surface of the top layer portion of the deposited TERA layer to prevent a photoresist problem during a subsequent lithographic operation.

2. (Canceled.)

3. (Canceled)

4. (Cancelled)

5. (Canceled)

6. (Currently Amended) The method as claimed in claim 1, wherein the first processing gases, the second processing gases, and/or the third processing gases comprise a hydrogen-containing gas ~~is employed during the creating, flowing at a~~ having an additional flow rate ranging from approximately 0.0 sccm to approximately 10000 sccm, wherein the hydrogen-containing gas comprises at least one of H_2O and H_2.

7. (Currently Amended) The method as claimed in claim 1, wherein the first processing gases, the second processing gases, and/or the third processing gases comprise an inert gas ~~is also employed during the creating, flowing at a~~ having an additional flow rate ranging from approximately 0.0 sccm to approximately 10000 sccm, wherein the inert gas comprises at least one of Ar, ~~He,~~ and N_2.

8. (Currently Amended) The method as claimed in claim 1, wherein the ~~plasma source has an RF source and the exposing further comprises:~~

~~operating the~~ RF source operates in a frequency range from approximately 0.1 MHz. to approximately 200 MHz[[;]]

~~operating the RF source in a power range from approximately 0.1 watts to approximately 200 watts~~ and the second RF source operates in a frequency range from approximately 0.1 MHz. to approximately 200 MHz.

9. (Currently Amended) The method as claimed in claim 1, wherein the establishing the post-processing plasma step has a lifetime time that varies from approximately 2 seconds to approximately 180 seconds.

10. (Currently Amended) The method as claimed in claim 1, wherein ~~the depositing the TERA layer comprises:~~

~~depositing a bottom portion of the TERA layer during a deposition time, wherein~~ the bottom layer portion comprises ~~a~~ material having a refractive index (n) ranging from approximately 1.5 to approximately 2.5 when measured at a wavelength of at least one of: 248 nm, 193 nm, and 157 nm, and an extinction coefficient (k) ranging from approximately 0.10 to approximately 0.9 when measured at a wavelength of at least one of: 248 nm, 193 nm, and 157 nm.

11. (Currently Amended) The method as claimed in claim 1 [[10]], wherein the depositing of the bottom layer portion of the TERA layer occurs at a rate from approximately 100 A/min to approximately 10000 A/min.

12. (Currently Amended) The method as claimed in claim 1 [[10]], wherein a ~~the~~ deposition time for the bottom layer portion of the TERA layer ranges from approximately 5 seconds to approximately 180 seconds.

13. (Canceled)

14. (Canceled)

15. (Currently Amended) The method as claimed in claim 1 ~~10~~, wherein the first processing gases, the second processing gases, and/or the third processing gases ~~depositing of the bottom portion further comprises:~~

~~providing the process gas, wherein the process gas~~ comprises at least one of a silicon-containing precursor and a carbon-containing precursor.

16. (Currently Amended) The method as claimed in claim 15, wherein the ~~providing~~ flow rate of the ~~process gas comprises flowing the~~ silicon-containing precursor and/or the carbon-containing precursor ranges ~~at a first rate ranging~~ from approximately 0.0 sccm to approximately 5000 sccm.

17. (Currently Amended) The method as claimed in claim 1 ~~15~~, wherein the ~~processing gas~~ first processing gases, the second processing gases, and/or the third processing gases further comprises at least one of monosilane (SiH_4), tetraethylorthosilicate (TEOS), monomethylsilane (1MS), dimethylsilane (2MS), ~~trimethylsilane (3MS),~~ tetramethylsilane (4MS), octamethylcyclotetrasiloxane (OMCTS), and tetramethylcyclotetrasilane (TMCTS).

18. (Currently Amended) The method as claimed in claim 1 ~~15~~, wherein the ~~processing gas~~ first processing gases, the second processing gases, and/or the third processing gases further comprises at least one of CH_4, C_2H_4, C_2H_2, C_6H_6 and C_6H_5OH.

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Currently Amended) The method as claimed in claim 1, wherein ~~the depositing of the TERA layer further comprises:~~

~~depositing a top portion of the TERA layer during a deposition time, wherein~~ the top layer portion comprises ~~a~~ material having a refractive index (n) ranging from approximately 1.5 to approximately 2.5 when measured at a wavelength of at least one of: 248 nm, 193 nm, and 157 nm, and an extinction coefficient (k) ranging from approximately 0.10 to approximately 0.9 when measured at a wavelength of at least one of: 248 nm, 193 nm, and 157 nm.

24. (Canceled)

25. (Currently Amended) The method as claimed in claim 1 ~~23~~, wherein the depositing of the top layer portion of the TERA layer occurs at a rate from approximately 10 A/min to approximately 5000 A/min.

26. (Currently Amended) The method as claimed in claim 1 ~~23~~, wherein a ~~the~~ deposition time for the bottom layer portion of the TERA layer ranges from approximately 5 seconds to approximately 180 seconds.

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Currently Amended) The method as claimed in claim 27, wherein the ~~precursor~~ first processing gases, the second processing gases, and/or the third processing gases further comprises at least one of tetramethylcyclotetrasilane (TMCTS)

tetraethylorthosilicate (TEOS) precursor, a dimethyldimethoxysilane (DMDMOS) precursor, and an octamethylcyclotetrasiloxane (OMCTS) precursor.

31. (Canceled)

32. (Canceled)

33. (Currently Amended) The method as claimed in claim 1 ~~32~~, wherein the substrate temperature ranges from approximately 0° C. to approximately 500° C during the depositing of the bottom layer portion of the TERA layer.

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Currently Amended) The method as claimed in claim 1 ~~36~~, wherein a ~~the~~ temperature of the shower plate assembly ranges from approximately 0° C. to approximately 500° C.

38. – 43 (Canceled)